

Report: Exploring Student Perspectives on Generative Artificial Intelligence Tools in Higher Education: A Survey-Based Study

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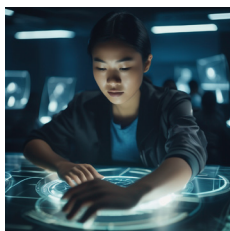


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AI Images:
Prompt: 'futuristic student holograph VR'
from ImgXL
CinematicPhoto.

INTRODUCTION

A BRIEF HISTORY OF AI TECHNOLOGIES

Narratives on artificial intelligence (AI) or thinking machines have a long and fascinating history, dating back to Homer's 8th century BCE epic poem *The Golden Maidens*, which features golden machines capable of independent thought, speech, and movement (Roos, D. 2023). Other examples, such as Mary Shelley's *Frankenstein* (1818), the Tin Man in L. Frank Baum's *The Wonderful Wizard of Oz* (1900), and the humanoid robots in the silent film *Metropolis* (1927), attest to humanity's enduring fascination with artificial intelligence and thinking machines long before the technology to create them existed (Buchanan, 2013).

Artificial intelligence systems were widely studied in the 20th century, with Alan Turing proposing the Turing test in the 1950s to measure machine intelligence by having a machine pass for a human in a conversation (Copeland & Proudfoot, 2007). Progress in this field built on a key computer development in 1949, when computers first stored commands (Anyoha, 2017). The advent of cheaper, more powerful, and more efficient computing throughout the 20th century led to the development of more complex machine learning algorithms, resulting in the defeat of reigning world chess champion and grand master Gary Kasparov by IBM's Deep Blue in 1997 (Evans, 2018).

The ability of artificial intelligence (AI) systems to gather larger datasets from the Internet and to learn from each other in the 2010s led to the application of many 21st century technologies (Lucci & Kopec, 2022). Such examples include spam filters, virtual voice assistants, autonomous vehicles, facial recognition, e-commerce and media platforms, fraud detection, and medical screening. These demonstrate the profound impact of AI upon the world around us.

Generative AI (GenAI) tools have been in development since the mid-2010s when Ian Goodfellow and his colleagues developed a new type of AI algorithm called a generative adversarial network (GAN). GANs are able to generate realistic images, videos, and audio by training two neural networks to compete against each other (JISC, 2023). Whilst the use of GANs tools can be harnessed positively in applications such as restoring digital voices for patients who have lost them (Boeren, 2022), they have also been used to create highly realistic deep fake AI images.

The potential for misuse of GenAI tools is a particular concern in the areas of politics, media, and fraud (Farid, 2022) where the application of synthesized voices, re-lip-

synced videos or changed faces have resulted in diminished public trust in digital media content (Danaher, J., 2017).

In 2017, OpenAI released GPT-2, a large language model that could generate human-quality text. GPT-2 was trained on a massive dataset of text and code, and it was able to generate text in a variety of different styles, including news articles, poems, and code.

The significant advances by OpenAI in algorithmic design, collection of data, and server processing speeds paved the way for ChatGPT-3 (Chat Generative Pre-trained Transformer), a groundbreaking generative AI tool released by OpenAI on November 30, 2022 (Hines, 2023). ChatGPT-3 quickly amassed one million users in just five days, making it the fastest-growing technology launch in history. By June 2023, it had a staggering 1.6 billion users. Timothy (2023) puts this into context by making a comparison between how long it took ChatGPT to amass 100 million users compared with other technologies.

Facebook: 4.5 Years
WhatsApp: 3.5 Years
Instagram: 2.5 Years
Google: Almost 1 Year
ChatGPT: 2.5 Months

Around the time of ChatGPT-3's launch, generative AI tools were portrayed in a negative light through science fiction-inspired narratives in the media (Dieter, 2021). Many such articles warned of the dangers of superintelligent AI and doomsday scenarios. These portrayals contributed to moral panics, highlighting the disparity between science fiction and reality in this area, and the role of storytelling in developing perceptions.

Paradoxically, there has been a surge in critical interest in generative AI, which has resulted in the emergence of thoughtful articles, analyses, and peer-reviewed publications. In the United Kingdom, the JISC National Centre for AI (JISC, 2023) has played a pivotal role in fostering a more balanced comprehension of generative AI within the education sector, while also highlighting its potential to facilitate student learning. Writers, including Stephen Wolfram (Wolfram, 2023) have explained how ChatGPT works, thereby enabling users to gain a comprehensive understanding of its functionality and operation.

Photo

Fashion Student Amalia Samoila reflects on the collaborative nature of working with Artificial Intelligence, using examples of her current work.



GENERATIVE AI AT THE UNIVERSITY OF NORTHAMPTON

Improvements in Generative AI have sparked significant interest and debate at the University of Northampton. The Centre for Active Digital Education's (CADE) AI Special Interest Group, established in 2022, has played a pivotal role in creating a community where staff can discuss these evolving technologies. CADE provides regular updates and organises both online and in-person discussions and debates. These activities have enhanced academic digital literacy in generative AI skills and explored a range of areas, such as the use of generative AI tools for contract cheating purposes, its ethical use, underlying bias in datasets, and data security.

In December 2022, the Learning Technology team began documenting the uses of generative AI technologies by interviewing early adopters of GenAI tools, including Rob Howe (Head of Learning Technology), Lee Machado (Professor of Molecular Medicine), Senior Fashion Lecturer Jane Mills, and two Fashion undergraduate students who were using GenAI in their projects (Lee, 2023). Participants raised various points of interest, such as the moral implications of authorship, assistive uses of these tools, perceptions of generative AI tools as creative collaborators, and ideas for creative uses of AI tools.

Recognizing the need for student voices in the discussion on generative AI technologies, the authors proposed a student survey to understand student perceptions of generative AI. This aimed to learn how students were using these tools, their motivations for doing so, the barriers preventing engagement, and their attitudes towards the development of these new technologies.

The survey results were presented at the University Teaching and Learning conference in June 2023 and have informed the development of new AI policies for both staff and students, an ongoing process overseen by the University AI Steering Group.

Generative AI has become a popular topic of research and development in 2023, as evidenced by a revised policy on student uses of AI, the ongoing work at CADE, the formation of a University AI Steering Group, the launch of a new staff development AI course, the publication of referencing AI guides, and a AI research projects supported by the University Innovation Fund.

METHODOLOGY

Following ethical approval in March 2023, The University of Northampton Learning Technology team conducted a survey of students' experience of generative AI from all faculties between May 4 and May 26, 2023. The survey received 129 anonymous responses, representing all faculties.

The survey was promoted across campus through a digital poster with a QR code and a link on the Student Landing Page in the Virtual Learning Environment NILE (Blackboard).

Created using Open Surveys, it comprised of 14 questions with branching logic. Responses were collected through multiple-choice questions, Likert scales, and open-text responses.

Themes included demographic information, tool usage, device preferences, reasons for utilisation, feedback on specific tasks, opinions on statements, perceptions on staff usage, and additional comments.

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The UON guidance has been designed to encourage staff and students to engage with AI in a measured, reflective and mindful way.

Kate Coulson

Head of Learning and Teaching Enhancement



Photo Learning Technologist Belinda Green discusses AI in the "Of Sound Mind" exhibition with Senior Lecturer Mark Thursby.

QUANTITATIVE FINDINGS

The survey revealed that most respondents (62%) were not currently engaging with generative AI tools for learning with ethical concerns and personal values emerging as the primary barriers to engagement among most students.

On the other hand, students who were actively using these tools (38%) highlighted their usefulness for a variety of tasks, including generating new content, summarizing content, and editing text.

ChatGPT was overwhelmingly the most popular tool (81.6%) with Bing AI, and DALL-E and Mid Journey placing joint second (24.5%). Laptops and smartphones were the primary devices used for engaging with generative AI.

Nearly half of the respondents were within the 18-24 age bracket (48%), when correlated with data on usage, age did not impact the adoption rate.

Within the survey, students were asked about their opinions on the use of AI in education yielding an unfair advantage and this was compared to their use of Generative AI tools in their studies. Analysis of this data showed that students who had not yet used generative AI tools were more likely to view their use as an unfair advantage than students who were already using them.

When asked how they felt about the advances and availability of AI generative tools during their studies, the majority of students (41.9%) had positive views, while 20.2% had a negative view.

Similarly, the study found a statistically significant association between students' opinions on the availability of AI tools for all students and their use of them in their studies.

Students who had used Generative AI tools were more likely to express agreement with the statement "AI tools should be available to ALL to ensure equality." The study's findings show that students with positive experiences of Generative AI tools were more likely to believe that they should be accessible to all students.

This pattern was also shown in response to the question 'Students trained in the use of AI tools will have more opportunities in the future', a significant majority (58%) agreed, again those who had used Gen AI tools were more likely to answer positively.

When asked about their awareness of the university's guidelines around the use of AI tools most students were not aware that these were published on the University web site.

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We need to understand the benefits and opportunities afforded through the use of AI and make use of them where relevant

Rob Howe

Head of Learning Technology



Image:

Text to voice tools such as Colossyan can be used to create AI avatars.



There isn't a single industry that isn't going to be affected by Artificial Intelligence.

Jane Mills

Senior Lecturer
in Fashion

AI images created by Jane Mills

QUALITATIVE FINDINGS

Four of the survey questions were open ended, allowing respondents to provide text input. An overview of the responses is shown below:

Benefits and challenges of using generative AI in higher education: Generative AI tools offer valuable assistance in education by aiding in idea generation, information synthesis, and text summarization, enhancing students' productivity.

These tools have the potential to support the teaching and learning process in higher education. However, there are ethical and academic integrity concerns associated.

Generative AI responses can lack personal perspectives and sometimes contain inappropriate references. Constructing appropriate prompts can be challenging, especially for second language learners.

Additionally, Generative AI-generated content may be biased or inaccurate, and it cannot evaluate content validity without human oversight.

Students noted that Generative AI tools were increasingly introducing premium subscription models and suggested that digital equality and poverty are concerns.

Regarding AI grading, many students expressed skepticism, believing that it cannot provide the same level of personalized and nuanced feedback as a human instructor. Additionally, some students raise concerns about the reliability and accuracy of AI grading, arguing that it may make mistakes or be biased. However, other students acknowledge the potential benefits of AI grading, such as its ability to provide quick and consistent feedback.

Regarding AI-generated teaching content, there is a wider range of opinions. Some students are optimistic about its potential benefits, such as its ability to create interactive and engaging materials. However, other students are concerned about its potential drawbacks, such as its lack of personality and specificity. Still others worry about the impact of AI-generated content on the role of human educators.



Images generated from the prompt 'AI Cyborg Robot' from ImgXL_CinematicPhoto available from the Poe Mobile App.

CONCLUSION

Given the widespread expectation of high usage within the media, the authors were surprised by the relatively low adoption rate of AI tools among students. When analysing the reasons for this, it is essential to recognise the significant threat to academic integrity posed by generative AI tools when using verbatim in student work, which could result in serious penalties for students.

This research highlights that students are aware of this issue, and their personal ethical concerns act as barriers to the use of these tools. Additional concerns include the reliability of content generated and the potential for these tools to undermine existing learned skills. These reservations about using AI tools highlight the need for AI developers and educators to address these concerns and ensure clarity and guidance on how these tools can be used ethically and to support learning.

In contrast, the survey shows that students who had adopted generative AI tools to support their studies found them helpful for a wide range of tasks, indicating the potential for these tools to be used as assistive technologies to enhance student learning. This strong association between tool use and their usefulness for a variety of tasks indicates the need for further support and guidance. By tailoring their approaches and support systems to these perceptions and needs, universities can enhance the educational experience and better prepare students for a world in which AI plays an increasingly prominent role in various fields. Students' strong perceptions within the survey data of the impact that AI will have on their future opportunities, further support this assertion.

Regarding access, although students strongly felt that the tools should be freely available to them during their studies, there was an association between these positive thoughts and their use of Generative AI tools. This suggests that managing access to AI systems in an educational context requires a nuanced approach that considers both the

potential benefits and concerns raised by students.

The diverse and polarised views of students regarding the use of AI tools by tutors, points toward the need for institutions to ensure they recognise the value that students place on human teachers and the importance of preserving the essential mentorship and guidance provided by academic tutors. This underscores the need for universities to adopt an approach that combines AI technologies with human instructors, promoting a blended learning environment that leverages AI for specific tasks while allowing educators to focus on personalised support, mentorship, and deepening the learning experience. Additionally, universities should prioritise transparency and communication regarding the use of AI in education. Addressing concerns about the potential replacement of human teachers and the accuracy of AI-generated content requires clear explanations of how AI tools are designed to enhance rather than replace the teaching experience. This includes promoting AI as a tool to assist educators in creating teaching materials while maintaining the human touch in teaching.

In summary, perceptions of AI technologies were found to be a major factor influencing willingness to use these tools. The findings that students are engaging in thoughtful consideration of AI technologies highlight their commitment to learning and underscore their esteem for the guidance and knowledge provided by their (human) academic tutors during their studies and also necessitate collaboration with students to gather further feedback that ensures that AI tools align with their educational needs and expectations.

This study underscores the importance of students' voices amidst AI noise to facilitate successful guidance and support within our institution. By better understanding student perceptions of generative AI tools and addressing student concerns, tutors can enhance the effectiveness of the learning process and prepare students for a future where AI plays a prominent role.

LIMITATIONS AND FUTURE RESEARCH

Limitations of the present study include the small sample size, which limits the generalizability of the findings. Additionally, the self-reported data may be biased, as participants may have over- or under-reported their use of and attitudes towards generative AI tools. Furthermore, the cross-sectional design does not allow for the assessment of changes in students' views over time. Finally, the benefits of students using generative AI to meet their learning outcomes was not explored, this is an important area for future research.

OUTPUTS

We developed the AI worksheet below to support academic staff, who can utilise it to prompt critical analysis, creativity, digital literacy, by considering and trialing the possible uses of generative AI.

We have to ensure that our graduates are ready to negotiate a world where AI will be a core part of their careers and indeed, their lives.

Kate Coulson

Head of Learning and Teaching Enhancement

How to use AI Chatbots such as ChatGPT & Bard AI

Ask questions and understand ideas	Practice and study for exams	Summarise and simplify texts	Challenge different ideas	Develop a plan for your project	Considerations
Chatbots can help answer your questions or explain complicated concepts. It's a good way to start learning something new.	You can ask for practice questions and study guides. These will help you practice and improve your knowledge.	You can ask your Chatbot to rewrite or summarise existing text in simple language or make a list of important points.	You can challenge existing text using other theories. This will help you think critically and consider different perspectives.	Your Chatbot can identify the roles required to complete a project and break it down into smaller manageable goals.	<p>Answers from Chatbots are predicted from their gathered data, and may display biased views and out of date information (ChatGPT data was last updated in 2021).</p> <p>They are predictive language models not factual databases, so they are highly likely to make things up and be factually incorrect.</p> <p>You should use these tools responsibly and seek approval from your academic tutors if you wish to include materials gathered from them in your work.</p> <p>See our UON Generative AI referencing guidance for details: https://libguides.northampton.ac.uk/referencing/ai/ethics</p> <p>You should never claim work generated by a Chatbot as your own, as this is cheating and considered academic misconduct.</p>
<p>'Can you explain to me the theory of post modernism?'</p> <p>'What are the main causes of inflation?'</p> <p>What does the term Self-actualization mean?</p>	<p>'Can you give me ten multiple choice and ten true/false questions on the subject of XXXXX'</p> <p>'Can you give me a study guide for Macbeth'</p>	<p>'Can you rewrite the text below in a way that is easy to understand for a ten year old.'</p> <p>'Can you summarise this text into five key points'</p>	<p>'What would a Marxist theorist think about the text below?'</p> <p>'Using Maslow's Hierarchy of Needs Definition', reflect on information in this URL: XXXXX.'</p>	<p>'List the different roles and stages required to make a Podcast'</p> <p>'Can you give me a schedule for my video project. My deadline is in four weeks.'</p>	

Student Guidance on the use of Generative AI tools by R Byles, K Lea, R Howe as an output of their research project 'Exploring student perceptions of Generative AI at UON' based on the survey data 'Student Survey on Generative AI'. CC 2023.

Available to download from the Learning and Teaching Enhancement site:
<https://mypad.northampton.ac.uk/lte/use-of-ai-in-academic-work/>

AI is the future and we have to get used to it. It's a tool made by humanity to help humanity, used in the right way it can be a very useful tool in any industry.

When we started using spell and grammer checking tools, it was considered as AI. Now AI enters a new era, humans should use it to boost capacity and increase performance.

If teachers and students both use AI in their tasks, it will effectively be beneficial for both of them.

To use it to completely write an essay is blatantly unethical as you have put no thought further than typing into a chatbot the essay you want.

AI can impact education system positively, therefore the staff and the students should learn, how to use the AI's in the correct way.

AI used for creative subjects to produce images or animations infringe on a lot of copyright laws, as the images or videos used to train the AI were not given by the creator nor used under fair use.

This software should be BANNED in education and only used in HE when researched.

As an arts student, I find it useful for refining project ideas towards a more understandable goal.

I don't like to use them for the simple reason that they are often flawed in their responses as far as their abilities go to relate data with specialist terms to concepts.

Scan me to find out more.

What are the perceptions of Generative AI tools among students?

Anonymous Comments from Student Survey May 6-26 2023

Kelly Lea and Richard Byles, Learning Technologists. Rob Howe, Head of Learning Technology

This poster was presented at the Teaching and Learning Conference in June 2023, it can also be used as a resource to discuss student perceptions with students.

AUTHORS



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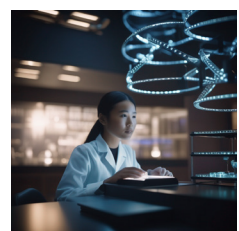
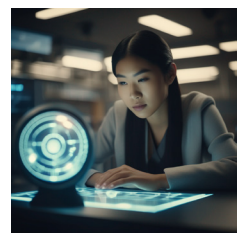
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Gen AI Images